

BUILDING A GRAPE AND WINE INDUSTRY ON MISSOURI PIONEERS; LESSONS LEARNED AND APPLICATIONS TO THE FUTURE

UNIVERSITY OF NEBRASKA
VITICULTURE PROGRAM WORKSHOP
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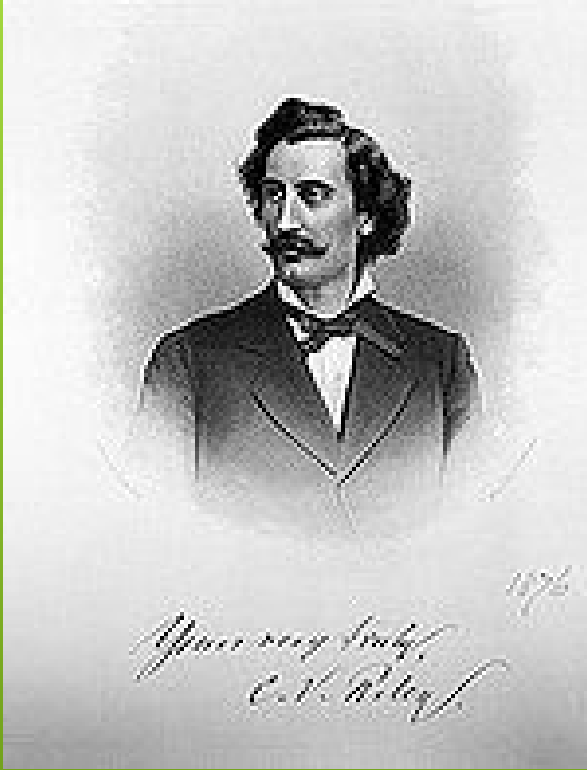
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- ▶ The Phylloxera epidemic in France in mid 19th century
- ▶ Charles Valentine Riley, first state entomologist for Missouri confirmed Phylloxera as the causative agent
- ▶ Cane wood of native American *Vitis* spp. sent to France to serve as rootstocks for *V. vinifera* cultivars
- ▶ Missouri has 6 native grape species; *V. aestivalis*, *V. cinerea*, *V. palmata*, *V. riparia*, *V. rupestris*, and *V. vulpina*
- ▶ First rootstocks were *V. riparia*, *V. rupestris*

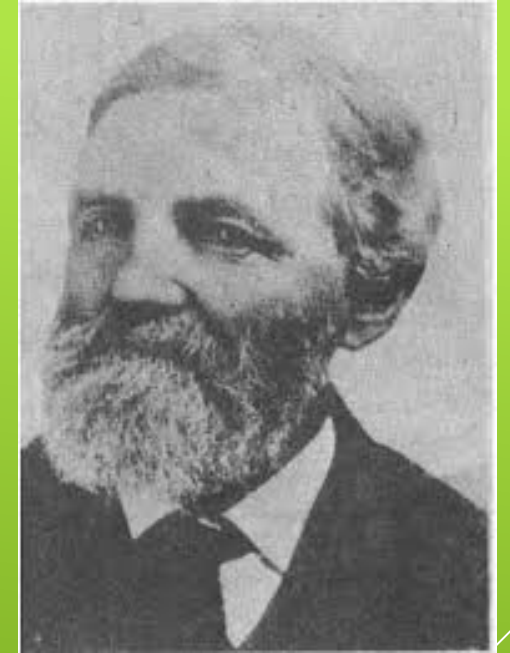
ADVENT OF ROOTSTOCKS



- First state entomologist for Missouri 1878
- Observed that native North American grapes resistant to grape phylloxera
- Received French Grand Gold Medal and named Chevalier of the Legion of Honor 1884

CHARLES VALENTINE RILEY

- ▶ American Grape Growing and Winemaking 1880
- ▶ Sent millions of cuttings of Taylor (*V. riparia*), Concord (*V. labrusca*), Clinton (*V. labrusca x Vitis riparia*), Lenoir (*V. vinifera* 69%, *V. berlandieri* 21%, *V. rupestris* 7%, *V. riparia* 3%), Cunningham (*V. aestivalis* bourquiniana), Herbemont (*V. aestivalis* bourquiniana), Elvira (*V. riparia x V. labrusca*), Norton (*V. aestivalis x V. labrusca*)
- ▶ Husmann's ethnicity is speculated to have excluded him from receiving a medal from the French government
- ▶ First professor of Pomology and Forestry at the University of Missouri 1879
- ▶ Considered one of the Fathers of the California grape and wine industry



GEORGE HUSMANN

- ▶ Grape grower and winemaker in Neosho, Missouri
- ▶ Grape breeder of which Jaeger 70 remains an important selection
- ▶ Received French Grand Gold Medal and named Chevalier of the Legion of Honor 1884



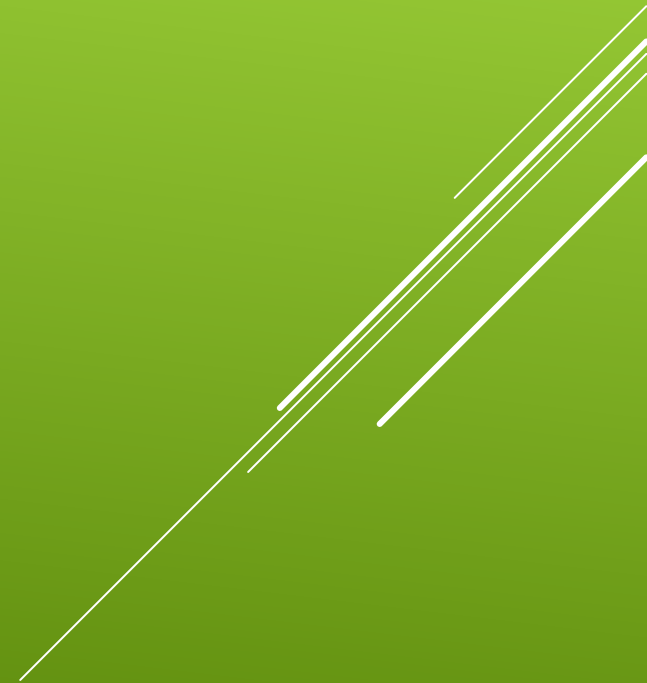
HERMANN JAEGER

- ▶ Author "School for American Grape Culture (1859)
 - ▶ One of the first books on grape culture and winemaking
- ▶ Settled in Hermann, MO

FRIEDRICH MÜNCH

- ▶ Established the nursery Isador Bush and Co. in 1870
- ▶ Settled in Bushberg, MO Jefferson County
- ▶ Bushberg Catalogue described grape growing, pest management and cultivar descriptions

ISADOR BUSH

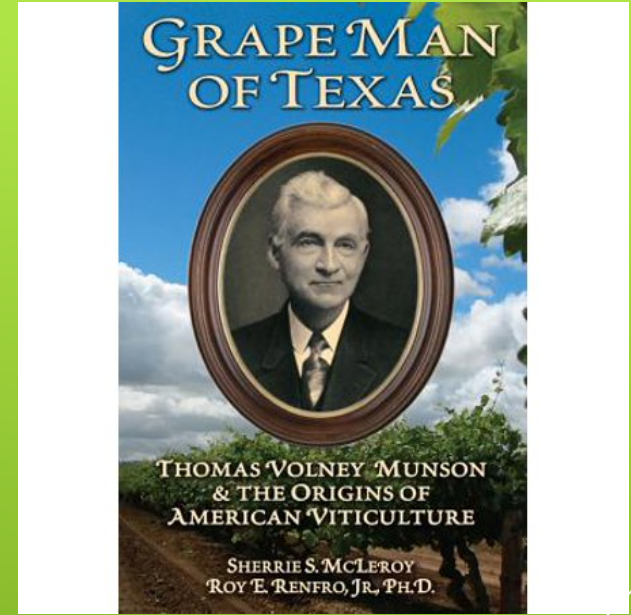


- ▶ “Notes on the Grape-vines of Missouri” 1860
- ▶ Collaborated with C.V. Riley on Phylloxera 1872
- ▶ Helped establish MO Botanical Garden and became chief scientific advisor in 1859
- ▶ Settled in St. Louis

GEORGE ENGELMANN



- ▶ Grape breeder in Denison, Texas
- ▶ Provided Texas rootstocks to France
- ▶ Received French Grand Gold Medal and named Chevalier of the Legion of Honor 1884
- ▶ Foundations of American Grape Culture 1909



THOMAS VOLNEY MUNSON

- ▶ 1904 approximately 11,000 acres of grapes in Hermann, MO
- ▶ 2016 there are approximately 1,800 acres of grapes in MO
- ▶ 1840's Isabella, Norton/Cynthiana, Catawba and Delaware introduced to MO
- ▶ Today Norton, Vignoles, Chambourcin, Vidal blanc, Concord....
- ▶ 1870's The winery (Michael Poeschel) today named Stone Hill shipped 1.25 million gallons of wine
- ▶ 2016 there were 130+ wineries in MO with 1.2 gallons sold annually

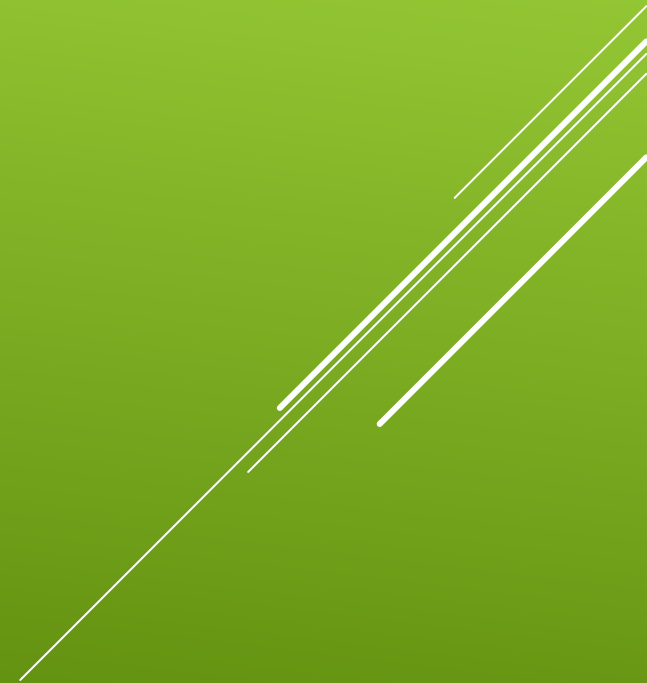
THE PAST AND FUTURE

- ▶ Governor Bob Holden designates Norton as the state grape of Missouri in 2003
- ▶ When Norton is quickly pressed
- ▶ “On touching the tongue is announces itself as the fiery product of a hotter sun, and operates as an elixir of life about the environs of the heart”

- Friedrich Münch, page 104 in “School for American Grape Culture” (1859)

- ▶ Augusta -1980
- ▶ Hermann - 1983
- ▶ Ozark Mountain – (Missouri, Arkansas and Oklahoma)
- ▶ Ozark Highland - 1987

MISSOURI AVA



- ▶ George Husmann and Hermann Jaegger realized native grapes would be the foundation of the MO wine industry
- ▶ Whereas other states kept planting old world cultivars without success
- ▶ Today MO has rebuilt their grape and wine industry on hybrids, French American hybrids, American heritage cultivars
- ▶ Resilient cultivars versus nonelastic cultivars
- ▶ Where are the *Vitis vinifera*?

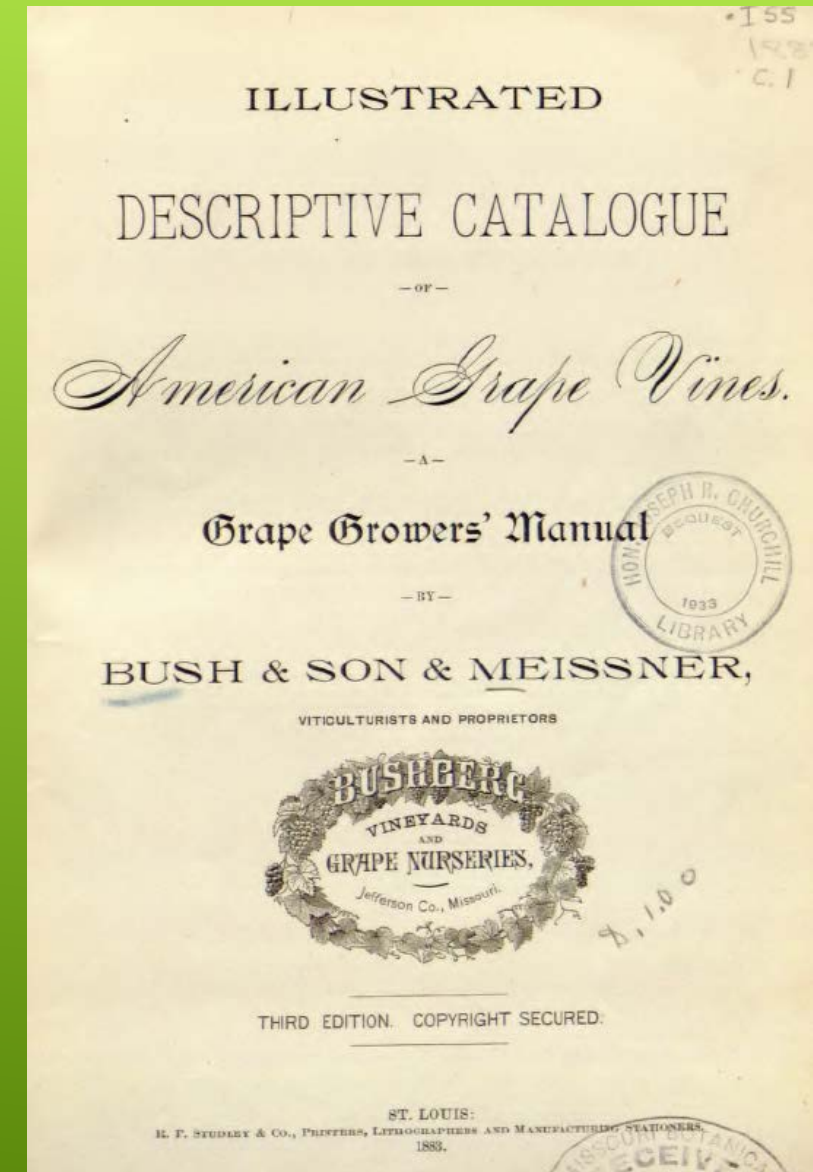
THE SEARCH FOR SOMETHING NEW

- ▶ Many planted *V. vinifera*
 - ▶ C.V. Riley and root phylloxera
- ▶ Common thought was to adapt *V. vinifera* over generations to the climate and soils
 - ▶ Failure

“ ...DOING THE SAME THING OVER AND OVER AGAIN AND EXPECTING DIFFERENT RESULTS” – ALBERT EINSTEIN

- ▶ Isador Bussh & Co established 1870, Jefferson County, MO
- ▶ American Grape Vines A Grape Growers Manual 1883

ISADOR BUSH



- ▶ *"Some, however, say that American wines are very inferior, "scarcely fit to drink"! This was the preconceived opinion of foreigners and great many of Americans too; also, most American hotels and restaurants keep none but foreign wines-or else native wines under foreign names and labels;..."*

-American Grape Vines A Growers Manual 1883

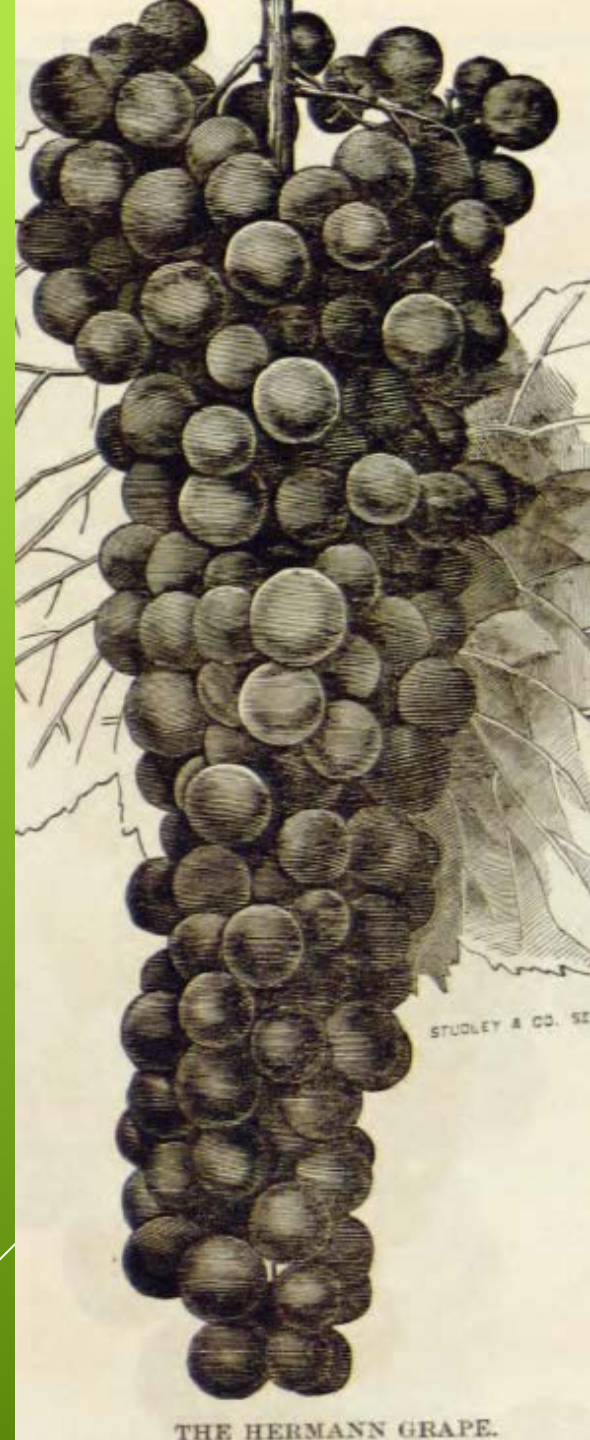
AFTER 138 YEARS

- ▶ Grape culture prior to:
 - ▶ Pyrethrum and soap 1850's
 - ▶ Sulfur 1850's
 - ▶ Paris Green 1867 Copper arsenite
 - ▶ Bordeaux mixture 1885 Copper sulfate and lime
 - ▶ Dithiocarbamate fungicides ~1915

ORGANIC GRAPE PRODUCTION

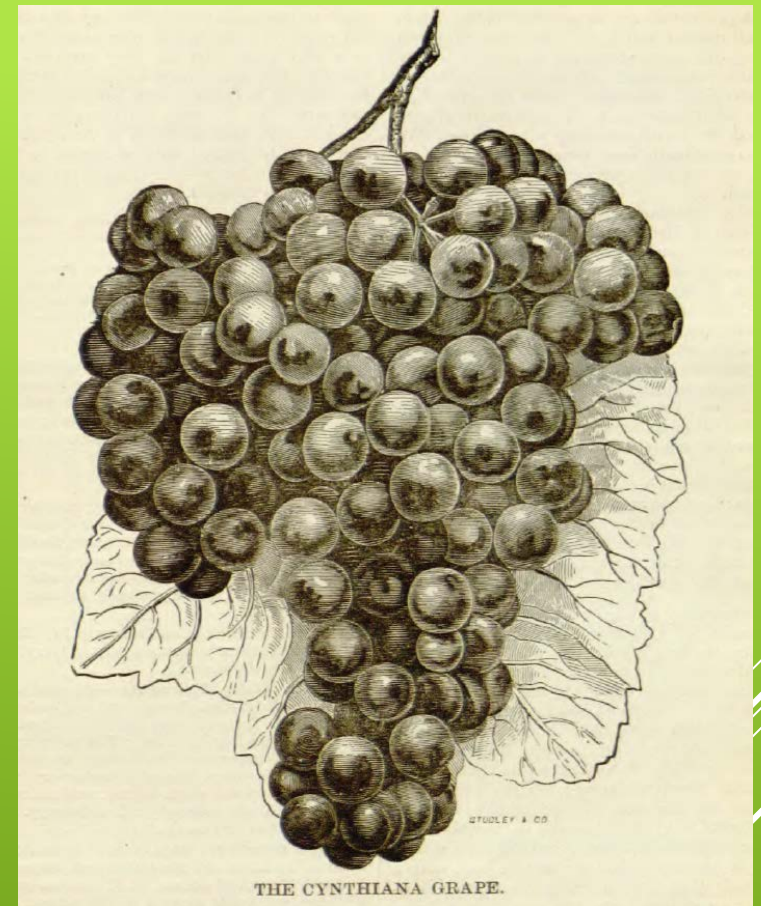
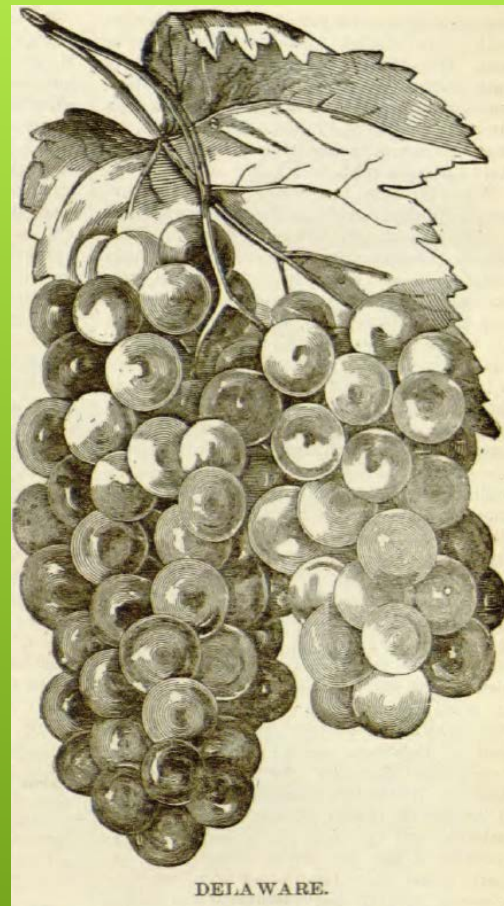
1. Select cultivars introduced prior to 1900
2. Example Elvira (Seedling of Taylor) – problem with splitting skins
 1. Plant seeds of progeny and make selections
 2. Etta was progeny of Elvira without splitting skins
3. Example Hermann – Seedling of Norton progeny
 1. Long 9" clusters
 2. Progeny of Hermann a white berried seedling

IDEA FOR ORGANIC GRAPE PRODUCTION



THE HERMANN GRAPE.

- ▶ Norton
- ▶ Delaware



RESISTANCE TO BLACK ROT

- ▶ Norton, Cynthiana, Norton's Virginia
- ▶ Concord, Hartford, Ives, Perkins, Champion, Cottage, North Carolina, Rentz and Venango
- ▶ Elvira, Missouri Riesling (Taylor seedling), Monteflore, Noah, Taylor

RESISTANCE TO MILDEW

- ▶ Old World Vines *V. vinifera* susceptible to the root form of Phylloxera
- ▶ In America, C.V. Riley evaluated roots of *V. vinifera* in Hermann, MO and found the root form of Phylloxera
- ▶ In America, main concern was the foliar form of Phylloxera



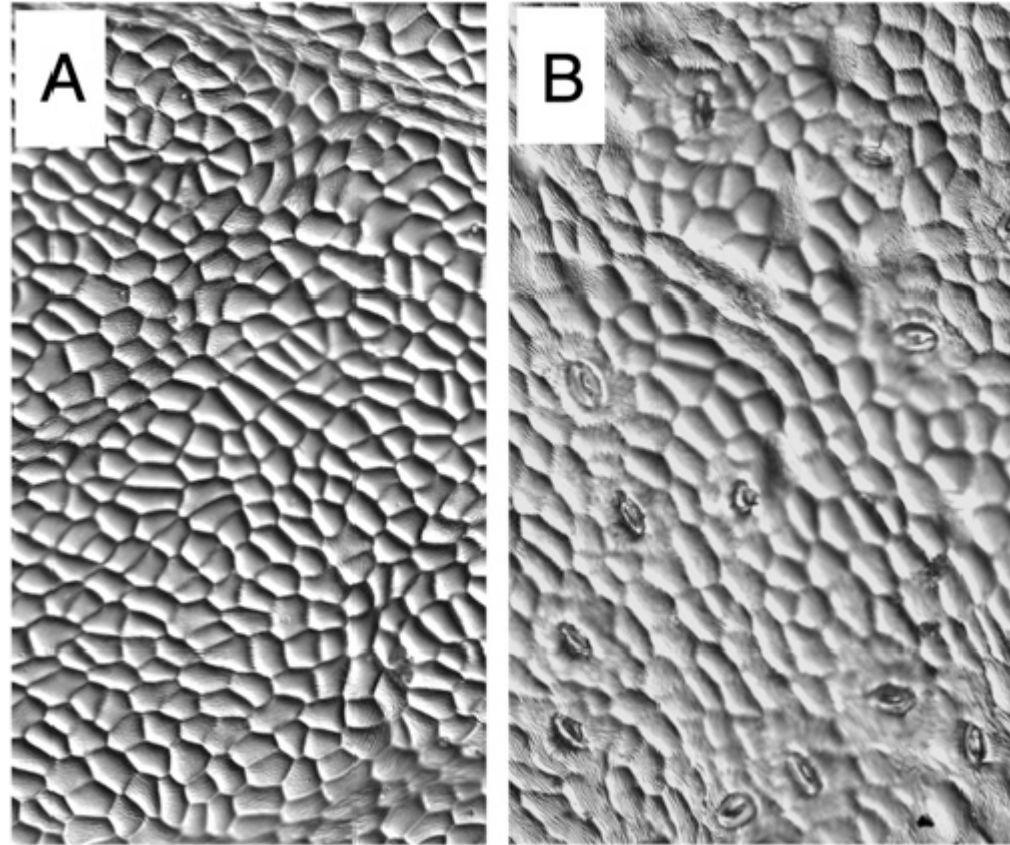
Under side of Leaf covered with Galls, nat. size.

CONCERN WAS ROOT PHYLLOXERA

- ▶ “By the end of September the galls (leaf) are mostly deserted and those which are left appear as if infected with mildew, eventually turn brown and decay”

- Grape manual 1883, p. 53

FOLIAR PHYLLOXERA AND DOWNY MILDEW



A) Upper or adaxial leaf surface of *Vitis*

B) Upper or adaxial leaf surface of *Vitis* infected with foliar phylloxera

Nabity, P. D. et al. 2013. Leaf-galling phylloxera on grapes reprograms host metabolism and morphology. PNAS

FOLIAR PHYLLOXERA AND DOWNY MILDEW



FOLIAR PHYLLOXERA AND DOWNY MILDEW



- ▶ Soil not limiting factor of grape growing
 - ▶ Importance of matching grape cultivar to soil and climate
- ▶ Climatic conditions of site impact success or failure
 - ▶ Unfavorable sites cannot be overcome by management of vines
 - ▶ Heavy dews promote mildews and rots
- ▶ Grape cultivars that perform well in one geographical location will not be a universal success in all locales of the world
- ▶ Grape cultivars that are successful in a location likely have some native grape from the area in their genetic background

GRAPE MANUAL – TIDBITS OF WISDOM